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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,549	03/10/2004	Gang Duan	GC791-3	6389
5100 7590 10/21/2008 GENENCOR INTERNATIONAL, INC. ATTENTION: LEGAL DEPARTMENT 925 PAGE MILL ROAD PALO ALTO, CA 94304				
EXAMINER				
KAM, CHIH MIN				
ART UNIT		PAPER NUMBER		
1656				
MAIL DATE		DELIVERY MODE		
10/21/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/798,549

**Applicant(s)**

DUAN ET AL.

**Examiner**

CHIH-MIN KAM

**Art Unit**

1656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 18-21 and 23-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 6, 7, 10, 18, 19, 23-26 and 29 is/are rejected.
- 7) ☒ Claim(s) 2, 5, 8, 9, 11, 12, 20, 21, 27, 28, 30 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of the Claims***

1. Claims 1-12, 18-21 and 23-31 are pending.

Applicant's amendment filed July 14, 2008 is acknowledged. Applicants' response has been fully considered. Claims 1, 3, 8, 9, 11, 12 and 23-25 have been amended, claim 22 has been cancelled, and new claims 26-31 have been added. Therefore, claims 1-12, 18-21 and 23-31 are examined.

**Withdrawn Claim Rejections - 35 USC § 103**

2. The previous rejection of claims 1-4, 8-12, 18, 19 and 22-25 under 35 U.S.C. 103(a) as being unpatentable over Lu *et al.* (J. of Zhenzhou Institute of Technology V22/2, p1-7 (June 2001)) as evidenced by Duan *et al.* (US 2005/0031734), is withdrawn in view of applicant's response at pages 6-8 in the amendment filed July 14, 2008.
3. The previous rejection of claims 1-6, 8-12 and 18-25 under 35 U.S.C. 103(a) as being unpatentable over Vercauteren *et al.* (U. S. Patent 6,025,168) in view of Knight *et al.* (U.S. Patent 3,630,774) as evidenced by Duan *et al.* (US 2005/0031734), is withdrawn in view of applicant's response at pages 8-10 in the amendment filed July 14, 2008.

***Claim Objections***

4. Claim 18 is objected because of the use of the term "A method according to claim 1". Since claim 18 is dependent from claim 1, use of the term "The method according to claim 1" is suggested.

***New Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3, 4, 6, 7, 10, 18, 19, 23-26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu *et al.* (J. of Zhenzhou Institute of Technology V22/2, p1-7 (June 2001)) in view of Rodgers *et al.* (U.S. Patent 3,832,472, published on August 27, 1974).

Lu *et al.* teach enzymatic preparation of isomalto-oligosaccharide using wheat starch as raw material, where the starch slurry is prepared by adding water to the starch and is liquefied by thermostable  $\alpha$ -amylase "SPEZYME Fred", saccharified by fungal  $\alpha$ -amylase "CLARASE L" and transglucosylated by "Transglucosidase L-500" (all from GENENCOR International) and the optimum conditions were obtained, e.g., liquefied to 15-17 DE, saccharified and transglucosylated at 55 °C for 24 hours and pH 4.5 (abstract; page 2; Table 1; claims 3, 4, 10, 18, 23-25). Lu *et al.* also teach the produced isomalto-oligosaccharide composition can be used in food industry (page 1; claim 19). However, Lu *et al.* do not teach contacting the wheat starch with a maltogenic enzyme such as beta-amylase.

Rodgers *et al.* teach wheat starch contains a native amylolytic enzyme such as  $\beta$ -amylase (column 8, lines 57-67; claims 6, 7, 26 and 29).

Although Lu *et al.* do not specifically indicate the steps of contacting grain ungelatinized starch with a maltogenic enzyme and a starch liquefying enzyme and to produce maltose (the first and second enzymes together), and contacting the maltose with a transglucosidase (the third

enzyme) at the temperature less than or at a starch gelatinization temperature, Rodgers *et al.* teach wheat starch contains endogenous  $\beta$ -amylase (a maltogenic enzyme). At the time of invention was made, it would have been obvious to one of ordinary skill in the art to combine the two references to make an isomalto-oligosaccharide composition from wheat starch as taught by Lu *et al.* using endogenous  $\beta$ -amylase (the first enzyme) and a thermostable  $\alpha$ -amylase (the second enzyme) to liquefy the starch slurry and to produce maltose (claim 1, step (a)), using a transglucosidase (the third enzyme) to produce an isomalto-oligosaccharide composition (claim 1, step (b)), and obtaining the final isomalto-oligosaccharide product (claim 1, step (c)) because the combination of the two references teaches the same method steps as the claimed method, i.e., using the same enzymes to react with the same starting material (i.e., ungelatinized wheat starch) to produce the same final product (i.e., isomalto-oligosaccharides). Thus, combinations of the teachings of Lu *et al.* and Rodgers *et al.* would result in the claimed invention and were, as a whole, prima facie obvious at the time it would have claimed invention was made.

#### Response to Arguments

Applicants indicate that Lu teaches liquefaction of starch, followed by saccharification and transglucosylation of the liquefied starch (See, e.g., flow chart 1.2.1 on page 2 of Lu). In contrast, the presently claimed methods comprise contacting *ungelatinized, i.e., non-liquefied* starch with maltogenic and starch liquefying enzymes *at a temperature less than or at the gelatinization temperature of the starch*. Lu specifically teaches that starch must be liquefied before contact with maltogenic and transglucosidase enzymes. A person of skill in the art would not predict success practicing a method for production of isomalto-oligosaccharide without first liquefying the starch, based on the teaching of Lu. In view of the foregoing, Applicants request

reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) (pages 6-8 of the response).

Applicants' response has been considered, however, the arguments are not found persuasive because of the following reasons. While Lu teaches treating wheat starch slurry with thermostable  $\alpha$ -amylase to liquefy the starch, Rodgers *et al.* teach wheat starch contains a native amylolytic enzyme such as  $\beta$ -amylase (column 8, lines 57-67). Since wheat starch contains an endogenous  $\beta$ -amylase, thus wheat starch slurry is treated with an endogenous  $\beta$ -amylase and a thermostable  $\alpha$ -amylase to liquefy the starch, which would produce maltose, and subsequently treating with transglucosidase at pH 4.5-5.5 and 50-60 °C (Table 1), which would produce isomalto-oligosaccharides. Thus, it would have been obvious to one of ordinary skill in the art that the combination of Lu and Rodgers would result in the claimed method of producing isomalto-oligosaccharides. Therefore, the claims are rejected under 35 U.S.C. § 103(a).

#### ***Claim Objections***

6. Claims 2, 5, 8, 9, 11, 12, 20, 21, 27, 28 and 30-31 are objected because the claims are dependent from a rejected claim.

#### ***Conclusion***

7. Claims 1, 3, 4, 6, 7, 10, 18, 19, 23-26 and 29 are rejected; and claims 2, 5, 8, 9, 11, 12, 20, 21, 27, 28 and 30-31 are objected to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathleen Bragdon can be reached at 571-272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Min Kam/

Primary Examiner, Art Unit 1656

CMK

October 15, 2008